CLAIMS

1. A conveyor/cooler of solid hot loose materials (3) generated by boilers and by various industrial processes, mainly comprising a sealed metal container (1) connected to a boiler or an incinerator (2-7), wherein a metal conveyor belt (4) is placed whereon the hot loose material (3) is collected, which thanks to the gravitational effect leaves the combustion chamber, by forming a traveling continuous bed of material whose cooling is carried out through the joint feeding of atomized water jets and air flows.

2. The conveyor/cooler according to claim 1, characterized in that the conveyor belt (4) consists of a regenerative heat exchanger which absorbs the heat from the material (3) during the forward run towards the unloading area (9) and it gives it up to the air in the return run.

3. The conveyor/cooler according to claim 1, characterized in that the device can be installed underneath the boilers or incinerators wherein the combustion occurs either under vacuum (2) or pressure (7) with respect to the outer atmosphere.

4. The conveyor/cooler according to claim 3, characterized in that the device allows the recovery of thermal energy taken from the hot material (3) when it operates under vacuum; said recovery takes place by introducing the heated air with the heat given up by the material (3) into the chamber of combustion of the boiler (2) by thus mixing it to the main combustion air.

5. The conveyor/cooler according to claim 1, characterized in that the intake air capacity into the metal container (1) from the air intakes (11-12) can be adjusted in order to optimize the cooling.

6. The conveyor/cooler according to claim 1, characterized in that a scraping conveyor (10) with chains or with a metal net is provided in order to scrape the material's dust from the bottom of the container (1), wherein is deposited and is conveyed towards the unloading area (9).

7. The conveyor/cooler according to claim 1, characterized in that in order to increase the cooling of the hot loose material (3) coming from the combustion chamber (2-7) an atomized water sprinkling system composed by a set number of nozzles (5) is used.

8. The conveyor/cooler according to claim 7, characterized in that the number of nozzles (5) therein, their plano-volumetric arrangement inside of the metal container (1) and the type of each single nozzle (5), are preset according to the chemical-physical characteristics of the conveyed material (3), according to the capacity of the same material and according to the desired cooling degree.

9. The conveyor/cooler according to claims 7 and 8, characterized in that the capacity of the nozzles (5), the intervention sequence and the duration of the activation are defined according to the temperature of the material (3) and according to the level of the capacity of the same material.

10. The conveyor/cooler according to claim 9, characterized in that inside the metal container (1) some temperature sensors (14) are installed whose signals are used in order to adjust the operation of the atomized water sprinkling system.

11. The conveyor/cooler according to claim 8, characterized in that the spraying angle of the nozzles (5) must be such to cover the entire surface of the traveling bed formed by the hot material (3).

12. The conveyor/cooler according to claim 7, characterized in that the nozzles (5) of the atomized water sprinkling system can be connected to a compressed air plant in order to jointly atomize water and air with respect to the need to optimize the cooling by appropriately measuring out the capacities of the two elements.

13. The conveyor/cooler according to claim 1, characterized in that the device is equipped with a capacity control system of the hot loose material (3) conveyed by the metal belt (4) which allows determining the reference values suitable to adjust the intensity of the cooling means (air and water).

14. The conveyor/cooler according to claim 13, characterized in that the capacity control of the hot loose conveyed material (3) can be carried out by using a weighing system (8) directly connected to the conveyor belt (4).

15. The conveyor/cooler according to claim 13, characterized in that the capacity control of the hot loose conveyed material (3) can be carried out by using a strap iron (15) hinged to the cover of the metal container (1).

16. The conveyor/cooler according to claim 1, characterized in that the plates of the metal conveyor belt (4) can be equipped with appropriate slots (6) in order to allow the passage of the cooling air flow through the whole layer of the continuous bed formed by the hot loose material (3) traveling above said metal belt (4).

17. The conveyor/cooler according to claim 16, characterized in that the geometry, the number and the arrangement of the slots (6) made in the plates of the metal conveyor belt (4) must be defined as a function of the type, the amount and mainly with respect to the grain size of the conveyed material (3) so as to avoid that this latter would leak and fall to the bottom of the metal container (1).

18. The conveyor/cooler according to claim 16, characterized in that it is possible to adjust the fraction of the cooling air flow which runs through the slots (6) made on the plates of the metal belt (4), with respect to the specific cooling needs and to the possible presence of unburnt matter.